

1. A seat mounting structure for use in a vehicle, that lessens the risk of injury to an occupant in side-impact collisions, the seat mounting structure comprising:

a sensor system;

a linkage system that guides a seat vertically up and laterally toward a centerline  
5 of the vehicle; and

an inflation module comprising an inflator and an inflatable structure, wherein the inflatable structure inflates in response to the sensor system, wherein the inflation of the inflatable structure displaces the seat in accordance with the linkage system.

10 2. The seat mounting structure of claim 1, wherein the inflation of the inflatable structure stiffens a floor structure of the vehicle to resist intrusion in a side-impact.

3. The seat mounting structure of claim 2, wherein the inflatable structure  
15 comprises metal.

4. The seat mounting structure of claim 3, wherein the thickness of the metal of the inflatable structure is in the range of about 0.04 inches to about 0.06 inches.

20 5. The seat mounting structure of claim 2, wherein the inflatable structure comprises an elongated structure having two folded sidewalls.

6. The seat mounting structure of claim 1, wherein the linkage system comprises a bar, wherein the bar comprises a first end pivotally fixed in position with respect to the vehicle and a second end pivotally fixed in position with respect to the seat, wherein the bar pivots about the first end and the second end in response to inflation of the inflatable structure in order to guide the seat vertically up and laterally toward the centerline of the vehicle.

7. The seat mounting structure of claim 1, wherein the linkage system comprises a track attached to a top portion of the inflation module, wherein the seat slides laterally toward the centerline of the vehicle while the inflatable structure displaces the seat vertically up.

8. The seat mounting structure of claim 1, wherein the linkage system comprises a rail, wherein the rail guides the seat vertically up and laterally toward the centerline of the vehicle in response to inflation of the inflatable structure.

9. The seat mounting structure of claim 1, wherein the displacement of the seat approximates curvilinear translation of the seat.

10. The seat mounting structure of claim 1, wherein the sensor system comprises an anticipatory sensor system that initiates the inflation of the inflatable structure in anticipation of an impending side impact.

11. The seat mounting structure of claim 10, wherein the anticipatory sensor system comprises an optical sensor.

12. The seat mounting structure of claim 10, wherein the anticipatory sensor system comprises a radar sensor.

13. The seat mounting structure of claim 1, wherein the seat mounting structure further comprises a seat belt coupled to the seat for restraining the occupant on the seat as the seat is displaced in accordance with the linkage system.

14. The seat mounting structure of claim 1, further comprising a side airbag.

15. A seat mounting structure for use in a vehicle, that lessens the risk of injury to an occupant in side impact collisions, the seat mounting structure comprising:

a sensor system;

a linkage system comprising a seat mount; and

an inflation module comprising a piston device, wherein the piston device actuates in response to the sensor system, wherein the seat is displaced vertically up and laterally toward a centerline of the vehicle.

16. The seat mounting structure of claim 15, wherein the linkage system comprises a bar, wherein the bar comprises a first end pivotally fixed in position with respect to the vehicle and a second end pivotally fixed in position with respect to the seat,

wherein the bar pivots about the first end and the second end in response to inflation of the inflatable structure to guide the seat vertically up and laterally toward the centerline of the vehicle.

5           17.    The seat mounting structure of claim 15, wherein the linkage system comprises a track attached to a top portion of the piston device, wherein the seat slides laterally toward the centerline of the vehicle while piston device actuates the seat vertically up.

10           18.    The seat mounting structure of claim 15, wherein the linkage system comprises a rail, wherein the rail guides the seat vertically up and laterally toward a centerline of the vehicle in response to a sensor system.

              19.    The seat mounting structure of claim 15, wherein the displacement of the  
15   seat approximates curvilinear translation of the seat.

              20.    The seat mounting structure of claim 15, wherein the seat mounting structure further comprises an anticipatory sensor system that actuates the piston device in anticipation of an impending side impact.

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              21.    The seat mounting structure of claim 20, wherein the anticipatory sensor system comprises an optical sensor.

22. The seat mounting structure of claim 20, wherein the anticipatory sensor system comprises a radar system.

23. The seat mounting structure of claim 15, wherein the seat mounting structure further comprises a seat belt coupled to the seat for restraining the occupant on the seat during the movement of the seat.

24. The seat mounting structure of claim 15, wherein the seat mounting structure further comprises an inflatable structure, wherein inflation of the inflatable structure stiffens a floor structure of the vehicle to resist intrusion in a side-impact.

25. The seat mounting structure of claim 24, wherein the inflatable structure comprises metal.

26. The seat mounting structure of claim 25, wherein a thickness of the metal of the inflatable structure is in the range of about 0.04 inches to about 0.06 inches.

27. The seat mounting structure of claim 24, wherein the inflatable structure comprises an elongated structure having two folded sidewalls.

28. The seat mounting structure of claim 15, further comprising a side airbag.

29. An inflation module for use in a vehicle, that stiffens a floor structure of a vehicle to lessen the risk of injury to an occupant in side impact collisions, the inflation module comprising:

an inflator; and

5 an elongated inflatable structure, securely attached to the floor structure, wherein the elongated inflatable structure is oriented perpendicular to a sidewall of the vehicle, wherein the inflatable structure comprises metal.

30. The inflation module of claim 29, wherein a thickness of the metal of the  
10 inflatable structure is in the range of about 0.04 inches to about 0.06 inches.

31. The inflation module of claim 29, wherein the inflatable structure is disposed under a seat of the vehicle.

15 32. A method for lessening the risk of injury to an occupant in side-impact collisions using a the seat mounting structure comprising a linkage system, an inflation module, and a sensor system, the method comprising:

sensing an impending side impact;

actuating the inflation module to displace the seat mount; and

20 guiding the seat mount vertically up and laterally toward a centerline of the vehicle.

33. The method of claim 32, further comprising stiffening a floor structure of the vehicle to resist intrusion in a side-impact, via inflation of an inflatable structure.

34. The method of claim 33, wherein the inflatable structure comprises a  
5 folded elongated metal inflatable structure.

35. The method of claim 32, further comprising inflating a side airbag.